

Title: Ancient Mosquito Signals Provide Targets for Behavioral Disruption

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Abstract:

The most dangerous animal on the planet, a mosquito, is fragile, slow moving and weighs less than a housefly. Yet this seemingly innocuous creature is responsible for vectoring diseases to humans causing millions of deaths annually. There is a desperate need for novel, creative tools for managing contacts between humans and mosquitoes, thus decreasing exposure to the diseases they vector. While the importance of the sense of smell in mosquito behavior has been documented at the behavioral level, the molecular mechanisms involved in detecting chemical signals are not well-understood. Furthermore, despite many years of research aimed at the discovery of behaviorally disruptive chemicals for preventing interactions between mosquitoes and their human hosts, DEET (N,N-dimethyl-n-toluamide) continues to be the predominant chemical used for protection despite reported disadvantages for its' use. We are using multiple approaches to understand sensory mechanisms used by mosquitoes to detect two ancient chemical signals responsible in part for host detection and location of oviposition sites. Since odorant receptors (ORs) for these signals are highly conserved among all species of mosquitos examined to date, they provide appropriate subjects for studies aimed at understanding mechanisms of chemoreception in mosquitoes and suitable targets for behavioral disruption.

Bohbot, J. D. and Dickens, J. C. 2009. Characterization of the octenol receptor in the yellow fever mosquito *Aedes aegypti*. PLoS ONE 4(9): e7032. doi:10.1371/journal.pone.0007032.

Vogt, R. G., Miller, N. E., Litvack, R., Fandino, R. A., Sparks, J., Staples, J., Friedman, R. and Dickens, J. C. 2009. The insect SNMP gene family. Insect Biochemistry and Molecular Biology 39:448-456.